

The Hamplatter

A Newsletter for the Fort Wayne Radio Club Members

Vol XX Issue 2

February 1994

From the Prez

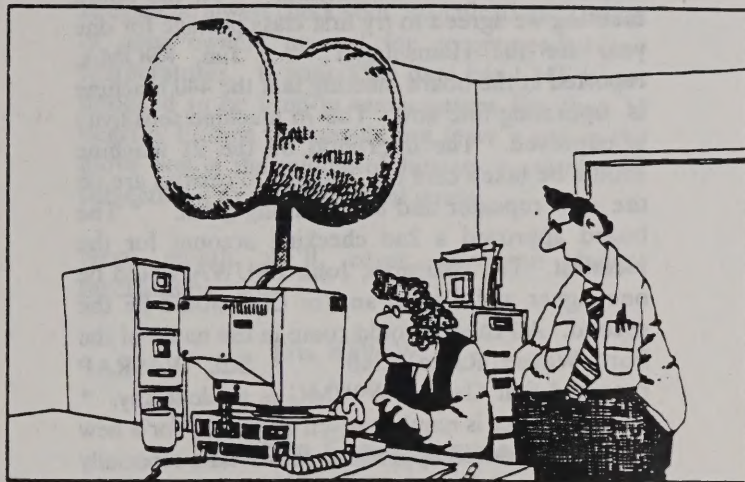
You've heard about it on TV. It has been endorsed by the FWPD! It has been endorsed by the Allen County Sheriff Dept and many other organizations. Yes folks, I'm talking about the "Club"! It was presented to me by no other than Ted Hughes KA9JTI at last months meeting. The "Club" is constructed of fine mahogany. It is twice the size of a normal sledgehammer and the ends are covered with high quality felt. This is to prevent scratching and marring when dealing with touchy subjects. Guaranteed to set off the next California earthquake when used properly. The "Club" - I'm not leaving home without it!

Three cheers for our auctioneers!!! A job well done by our two auctioneers Jim Pliett K9OMA and Dave Beltz KF9DE. I think these guys could sell Igloos to Eskimos. But what a crowd. We had over 120 sign in (and that did not include guests). I hope everyone found what they were looking for. I think Dorm Walker got the best bargain (a free Tandy TRS-80 Computer). See what can happen when you hang around auctions late... Oh, by the way, Dorm says parts are missing and the computer won't work. He would appreciate any advice on what to do with it. Hi Hi. All kidding aside, the FWRC Auction was a tremendous success. The auction would not have been possible without the coordinated efforts and hard work of all those involved. My many thanks.

I hope by now that everyone has survived the big chill. It's still too cold for tower work, so come to the Feb meeting where our own K9OMA Jim Pliett is going to warm things up with a seminar on how a poor (or married) ham can get into ATV. Or should I say "low budget". Keep your fingers crossed as we might have a special guest speaker from Chicago. Don't miss it. There will be plenty of hot coffee waiting and some donuts too. See ya' there.

Saloon for now.....

Cliff N9MKB



"OH YEAH, AND TRY NOT TO ENTER THE WRONG PASSWORD"

(Cliff's "Club" for computer security?)

This month's meeting will take place on Friday, February 18, 1994, 7:30 pm at the Salem Church of Christ on Lake Avenue, Ft Wayne. The program will be a presentation on budget ATV, by Jim Pliett, K9OMA. Jim, by the way, was voted to fill the vacant Board Member position at the January meeting.

Code and Theory Classes

The spring semester of morse code and Novice/ Technician theory classes will begin on March 14 and will meet every monday and tuesday night at the ITT Tech classrooms on Coldwater Rd, next to Red Lobster. Check local packet clusters or the March "Splatter" for full details, when available.

The next VE testing will take place on May 7, 1994, 9:30 am, at the Georgetown Branch of the Allen County Fort Wayne Public Library, 6600 E. State Blvd.

The December meeting of the Fort Wayne Radio Club was held December 3, 1993 at the Lantern in the form of a Christmas Party. A fine buffet was enjoyed by all. A gift exchange followed. The actual meeting started at 8:30 with introductions. * The November minutes were read and approved. There was no treasurer's report. * Dave, KF9DE announced that there would be a special election at the January meeting to fill the vacancy left by Charlie's, KC9LA, resignation from the board. It will also be the annual auction. * At the board meeting we agreed to try first class postage for one year for the Hamsplatter. * Jim, K9OMA, reported at the board meeting that the 440 machine is operating fine now. The 76 machine sensitivity is improved. The inter-mod on the 91 machine should be taken care of. The old 76 cavities are on the new repeater and it is working great. * The board approved a 2nd checking account for the Hamfest. The chairman, John K9UWA would be one signer and Teresa and/or Cliff would be the second. All checks would come in the name of the Fort Wayne Radio Club. * Bill, WA9RAP reported that George W9VMG is a silent key. * Carol Streeter is number seven on the list for a new heart. She would appreciate phone calls especially from YL's. * Dave introduced our new president, Cliff, and Jean as communications manager, and Teresa as treasurer. * Dave thanked all for a fun evening and a great year. Meeting adjourned at 9:00.

Respectfully submitted, Carole Burke, WB9RUS

Fox Hunt Round-Up

Jim, K9OMA and Carl, N9NRO won the January hunt. The February fox hunt has been scheduled for Sunday the 20th. Meet at the Allen County 4-H Fairgrounds on Carroll Road between 1:30 & 1:45 PM. The hunt will begin at 2:00 PM. Last time when Jim was the fox, he bounced his signal off the Pine Valley water tower, keeping all pursuers at bay for a long time! I wonder what large inanimate object they'll use this time? Maybe aircraft departing Baer field? Look for the hounds moving in a south-westerly direction every two minutes! It will be a real challenge. For more info, contact Dave, KF9DE either on the I.M.O. Net or on 146.76. The fox will be on 146.43 MHz. Home stations are welcome too.

Van Wert, Ohio Fox hunts are on the first sunday following the first saturday of the month at 1:30 pm. Meet at the W8FY clubhouse which is located on the same property as the Ohio State Highway Patrol Post on the east side of the city limits. Contact Les N8NHS for more info.

This is part one in a series of articles concerning electrical components, failure mechanisms, and testing/troubleshooting.

Well, there I was, talking to a fellow novice from California on the 40 meter band, morse code. I was using a Heath HW-101 transceiver that I had recently purchased at a hamfest and had gone through and replaced all of the tubes which were no longer within spec. This was my third contact on this new "super rig" which sported tremendous firepower over my trusty old 1/2 watt HW-7. Upon my second transmission, a white wisp of smoke began to curl out of the wire mesh vents on the back-end of the rig, a faint scent of burning bakelite intensified - then a flash of fire belched underneath, scorching the desk top. I stopped transmitting, flipped the rig over, and blew out the fire. As the power supply capacitors were clinging to life in a fatal, diminishing discharge, I could hear my contact calling KA9IPJ? KA9IPJ? through my headphones as the audio output died away. It was too late. My new radio was kaput. Nothing could be done to salvage the contact. It turned out that a 49 cent one-watt carbon comp resistor had shorted and caught fire. When replaced, the rig worked fine.

Many of you have probably faced similar catastrophes, finding out later that a small, inexpensive component had failed. If you sent your rig to a certified repairman, or own one of those new, digital microprocessor controlled rigs, your repair was probably a little more costly.

Why do components fail? I have worked as a reliability engineer and currently work in a failure analysis lab, where I deal with failed components on a daily basis. Surprisingly, we find that up to 90% of component failures are due to mechanical origin and manifest themselves as a short or open. Shorts occur when a conductive material links two isolated electrical lines. Sometimes they are a by-product of the manufacturer such as metallic shavings, other times the result of exotic metal growths like dendrites or tin whiskers. Opens mainly occur when two previously joined electrical conductors separate. This can be the result of corrosive attack of a metal conductor, electromigration of metal atoms in a high-current circuit line, mechanical fractures, or a poor connection like a solder joint or loose fastener.

Temperature plays a vital role in how fast a component failure will occur. All materials expand and contract when exposed to hot and cold temperatures. In the physics arena, this is known as the linear coefficient of expansion (LCE). Every material has a different rate of expansion.

Reliability/Failure Analysis

(Continued from page 2)

Aluminum, for example, has an LCE figure of 25. Silicon has an LCE figure of 3. Let's assume that we made a semiconductor device out of silicon and designed a layer of aluminum in the middle of it. Upon heating, the aluminum is going to increase its linear dimensions by a factor of 8:1 over the silicon. Upon cooling, the aluminum will contract by a factor of 8:1 to the silicon. Several cycles of heating and cooling will eventually see the aluminum layer separate, or delaminate, from the silicon. Delamination accounts for failures in capacitors, poor solder joints, and circuit boards.

"Temperature cycling" occurs when we expose our electronic devices to varying cycles of hot-cold-hot, or cold-hot-cold. This can happen outdoors during the normal heating and cooling action of the day, or inside an automobile during the winter and summer months.

Temperature cycling can cause problems with many of the plastic encapsulated ICs and transistors. Your average plastic DIP IC at Radio Shack is more than just a block of plastic with metal leads sticking out of it. In the middle of the plastic is a small silicon die with aluminum traces on the surface and fine aluminum wires (about 0.001 inch diameter) which attach to the external leads. If the part is commercial grade, it is designed to operate in room-temperature environments only. If you take it outside, it will see very hot and cold temperatures (+125 to -25 degrees F). Moisture in commercial-grade plastic will expand and contract around the die and fine bond wires under these conditions and has the effect of bending the wires. What happens when you bend a piece of 18 gage copper wire back and forth a few times? It will soften at the bending point and break apart. This is what happens in a poorly LCE-matched encapsulated part. The bond wires break and the die will delaminate from the plastic.

Another problem with fine wires in electrical components, such as plastic encapsulated ICs, wire-wound resistors, and coils, is tensile breakage. If a wire is strung tightly between two contact points without any slack, it will be stretched during cold temperature exposure. Take a piece of clay or dough and roll it into a uniform diameter rope. Pull on each end - this represents the forces exerted on a wire during cold temperatures. You will notice that the rope thins down in the middle and eventually breaks. This is known as a tensile fracture.

So what do we do to avoid delamination, bending fatigue, and tensile breakage due to temperature cycling?

First, we need to select the right parts for the intended operating temperatures. If the device is to be used indoors in a temperature controlled climate, commercial-grade parts will do just fine. If the device is going to be mounted on the top of your tower, sit in your car, or work in an unheated building, you might want to consider using automotive or military grade parts. They are designed with LCE mismatches in mind and are guaranteed to survive temperature cycling stresses. Because of this, however, they do cost more than commercial parts. If you buy ready-to-operate ham equipment, always check your "specifications" section of your owners manual for recommended use temperatures. If your \$500 dual band HT is not designed to be used in temperatures less than 14 degrees F, then you should not leave it out in the glove box in the middle of January - you may be subjecting it to undue thermal stress.

Next month we'll cover corrosion failure mechanisms...

Kris, KF9AW

Shuttle Frequencies

ARRL Bulliten

How can I use my shortwave radio for news and information about sarex and to eavesdrop on the astronauts?

During a shuttle mission carrying the SAREX payload, news and Astronaut re-transmissions are carried on these Amateur Radio stations:

Goddard Amateur Radio Club (Greenbelt, MD) Amateur Radio station WA3NAN, news and re-transmissions on high frequency (HF) bands at 3.86, 7.185, 14.295, 21.395, and 28.65 MHz and on VHF at 147.45 MHz.

Johnson Space Center Amateur Radio Club (Houston, TX), Amateur Radio station W5RRR, news bulletins on HF bands at 3.850, 7.227, 14.280, 21.350, and 28.400 MHz and VHF at 146.64 MHz.

ARRL (Newington, CT) Amateur Radio station W1AW, news bulletins (9:45 PM, 12:45 AM EST) on HF bands at 3.99, 7.29, 14.29, 18.16, 21.39, 28.59 and VHF at 147.555 MHz.

Listen also to the ARRL Bulletins on W1AW (see the ARRL's monthly journal, "QST", for Morse code and voice bulletins) on a daily basis; and to the AMSAT International Satellite Nets on Tuesdays, 3.840 MHz, 0130Z to 0300Z, and on Sundays, 14.282 MHz, 1800Z to 2100Z, +/- QRM.

DX News

OPDX/BARF-80

3Y0PI, PETER I ISLAND DXPEDITION (Now through February 19). The United States will be worked by numbers, following the propagation patterns: 1-2-3-4-8-9-0-5-7-6. The operators request that you do a minimum of duping. Operating frequencies are: CW: 1826, 3522, 7022, 10104, 14024, 18074, 21024, 24894, 28024. SSB: 1845, 3785, 7065, 14195, 18145, 21295, 24945, 28475. RTTY: 1825, 3680, 14080, 21080, 28180. Satellite: 145.890 MHz (listening down) on AO-10 and AO-13.

A3, TONGA. Jim Smith, VK9NS, will be active as A35MR starting around February 2. There is talk he may activate a new IOTA. Meanwhile, Nob, JF2MBF, (also known as VR6BB/JJ) will sign A35JJ from February 12-20, all bands on CW/SSB/RTTY/SAT. QSL via JR2KDN.

FT5, KERGUELEN ISLAND. Pierre, FT5XJ will be on the island until July. He was reportedly active on 14250 kHz and 14191 kHz (1400Z). Pierre states he is more often QRV on 14198 kHz. QSL to F5NLL.

SV/A MOUNT ATHOS. Monk Apollo, SV2ASP/A, has been heard on some of the WARC bands, especially on 17 meter band with a very strong signal. Apollo can often be found on 3790 kHz at 1700z and on 3792 kHz around 0530z.

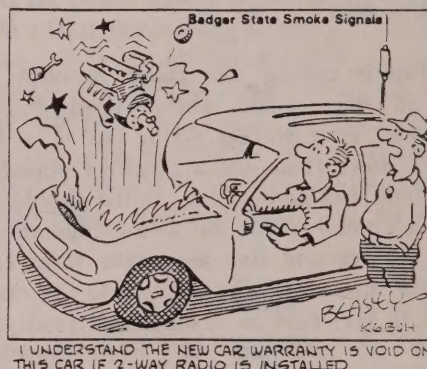
VP5, TURKS & CAICOS ISLANDS. Ed/K9IMM and Carol/NS9L will be on Providenciales Island (VP5) February 17-24. K9IMM will be operating the ARRL CW DX Contest on 160 meters as VP5B. Before and after the contest they will operate as VP5/own calls on all bands 160-10m. Some QRP operation is contemplated. QSL via WB9NOV (SASE please).

ZS0, PENGUIN ISLANDS. It appears Baldur, DJ6SI, has made semi-final arrangements to be on the islands from February 22-28. His possible callsign may be ZS0X.

DXCC YEARBOOK. The first annual DXCC Yearbook will soon be in the mail in early February for those active DXCC members who had submissions between October 1, 1992, and September 30, 1993.

Membership Forms

On short month printings, such as this month, the calendar will occupy the inside jacket cover. If you need a copy of the membership form, contact me at the numbers below and I will promptly send you a copy via modem, packet, or US mail, which ever is preferable. Thanks, Kris KF9AW.



Do you have an interesting article, news item, or cartoon which you can contribute to the Hamsplatter? Do you have some spare equipment collecting dust that you want to sell? If so, please contact me, Kris, KF9AW. My day phone is 487-3286, evenings 486-7324. Packet messages can be directed to me on 144.91, cluster KR9U or K1FJ-2, or on 144.97, W9INX.

The Hamsplatter

Is published monthly by the Fort Wayne Radio Club,

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**Repeaters: 146.16/.76 449.875/444.875 (Voice) 146.31/.91 (Autopatch)
439.25/910.25 (Video) 144.34 (Aux sound input to video)**

March 1994 - Communications Calendar

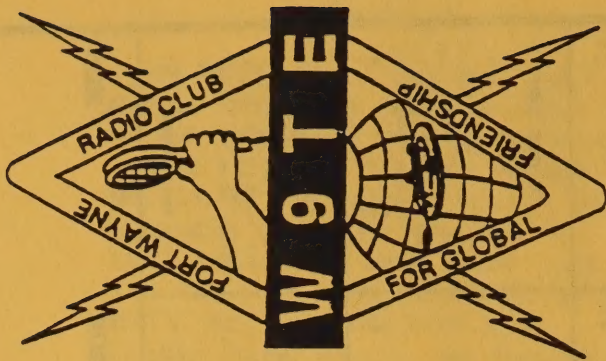
BUN	MON	TUE	WED	THUR	FRI	SAT
February 1994 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28	April 1994 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18	1 Hunt. ARES 01:00 TNT 20:00	2 Whitley ARES 00:15	3	4	5 Hunt. ARES 01:00 ARRL SSB DX >
6 Swap Net 00:30 Sloppy Code 02:00 Van Wert Fox Hunt 13:30 < ARRL SSB DX	7	8 Hunt. ARES 01:00 TNT 20:00	9 Whitley ARES 00:15	10 FWRC Board 19:30	11	12 Hunt. ARES 01:00 QCWA SSB QSO >
13 Swap Net 00:30 Sloppy Code 02:00 < QCWA SSB QSO	14	15 Hunt. ARES 01:00 TNT 20:00	16 Whitley ARES 00:15	17 St. Patrick's Day	18 FWRC Meeting 19:30	19 Hunt. ARES 01:00
20 Swap Net 00:30 Sloppy Code 02:00 Maumee OH Hamfest	21	22 Hunt. ARES 01:00 TNT 20:00	23 Whitley ARES 00:15	24	25	26 Hunt. ARES 01:00 CQ WPX SSB > Mich. City hamfest
27 Swap Net 00:30 Sloppy Code 02:00 < CQ WPX SSB	28	29 Hunt. ARES 01:00 TNT 20:00	30 Whitley ARES 00:15	31		

Check QST and CQ for Contest Times and Rules

[Key: > Event begins < Event ends]

NET FREQS: TNT 146.76 Murphy Swap 146.94 Sloppy Code 7.1405 Huntington ARES 146.685 Whitley ARES 147.150

Daily Nets: Ft Wayne 6m 50.58 (simplex), 00:00 | IMO Traffic 146.88 23:30 | 21 Repeater Group 147.150 02:00 | Auburn 147.360 23:00



February 1994

HAMSPATTER



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